Wholesale Gas Price Caps Under Physical Scarcity

A 2026 Hormuz Scenario Analysis

Abstract. The EU Market Correction Mechanism (MCM) expired on 31 January 2025 without triggering. This note examines what would happen if a new emergency wholesale gas cap were enacted under the supply conditions created by the March 2026 Hormuz disruption. The primary transmission mechanism is cargo diversion: a cap that suppresses the TTF reference price reduces the European import netback below the Asian JKM equivalent, diverting swing LNG cargoes away from European terminals and reducing delivered volumes rather than delivered costs. A deadweight loss calibration across central parameter values suggests a lower-bound welfare cost of roughly EUR 395 million per month through the smooth diversion channel; when physical rationing begins, the relevant cost measure shifts to the value of lost load, implying welfare losses several orders of magnitude larger. A gas cap also widens clean spark spreads, creating generator windfalls, and may trigger price-review clauses on long-term supply agreements. The case for a broad wholesale cap appears weakest when physical scarcity is most acute.

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1. The MCM: What It Was and When It Expired

A precise description of the legal object under discussion is a precondition for any serious analysis of European gas price intervention. The EU MCM, established under Council Regulation (EU) 2022/2578 and modified under 2023/2843, was not a hard cap on physical gas prices or OTC bilateral contracts.[1] It was a dynamic bidding limit on TTF and other designated exchange-traded gas derivatives, activated only if (i) TTF front-month exceeded e180/MWh for three consecutive trading days and (ii) TTF stood more than e35/MWh above a reference LNG import price. OTC bilateral contracts were explicitly outside its scope.

[1] Council Regulation (EU) 2022/2578, *Official Journal of the European Union*, L 335, 29.12.2022. Council Regulation (EU) 2023/2843 amending the mechanism.

The MCM was never triggered and was not renewed after 31 January 2025. As of 1 April 2026, TTF May-26 settles near e48.76/MWh, about 73 per cent below the old EUR 180/MWh threshold.[2] The note therefore analyses a scenario in which a new emergency wholesale cap is enacted at a price meaningfully below a hypothetical elevated equilibrium; Section 3 specifies and justifies the parameter ranges used.

2. The Disruption: Key Facts

On 28 February 2026, joint US-Israeli airstrikes triggered the IRGC's effective closure of the Strait of Hormuz. The IEA characterises the result as "the largest supply disruption in the history of the global oil market."[3] Roughly 20 mb/d of crude and products had transited the Strait in 2025, representing approximately 20 per cent of global seaborne oil trade; flows fell below 10 per cent of pre-war levels within days.[4]

Gulf production fell by at least 10 mb/d. Brent crude peaked at $126/bbl on 8 March 2026 before easing to approximately $107/bbl by 21 March, following the IEA announcement of a 400 million barrel emergency reserve release on 11 March.[5][6] That release covers approximately 3.8 days of global demand at 105.17 mb/d.[6]

Iranian missile strikes targeted the Ras Laffan terminal on 18-19 March. QatarEnergy subsequently declared a long-term force majeure on exports, with documented capacity reductions reaching approximately 17 per cent of Qatar's LNG export capacity.[7] Qatar supplied somewhere in the high-single to low-teen percentage range of EU LNG imports before the crisis, while IEA data indicate that LNG transiting the Strait accounted for around 7 per cent of Europe's total LNG

[2] ICE Endex TTF Natural Gas Futures, May-26 settlement, 1 April 2026.

[3] IEA, *Oil Market Report, March 2026*, 12 March 2026. https://www.iea.org/reports/ oil-market-report-march-2026.

[4] IEA, *Strait of Hormuz Factsheet*, February 2026. https://www.iea.org/about/ oil-security-and-emergency-response/strait-of-hormuz.

[5] IEA, *IEA Member Countries to Carry Out Largest Ever Oil Stock Release*, Press Release, 11 March 2026. https://www.iea.org/news/ iea-member-countries-to-carry-out-largest-ever-oil-stock-release-amid-market-disruptions-from-middle-east-c

[6] ÷105.17 = 3.81 days. EIA, *Short-Term Energy Outlook*, March 2026. https://www.eia.gov/outlooks/ steo/.

[7] QatarEnergy official communications, March 2026; reported by Reuters and Bloomberg, 19-22 March 2026. Some analyses cite a complete cessation of all 77 mtpa; the documented disruption is a partial reduction and that larger figure overstates what has been disclosed.

[8] 8Euronews, 31 March 2026. https://www.euronews.com/my-europe/2026/03/31/ strait-of-hormuz-shutdown-what-implications-for-europe-for-how-long-and-how-high-can-price; IEA, *Strait of Hormuz Factsheet*, February 2026. [9]ACER, *Gas Market Monitor*, March 2026.

inflows in 2025.[8] European gas storage entered the crisis at approximately 30 per cent fill, well below the 90 per cent pre-winter target, following a severe 2025-2026 winter.[9] Against that backdrop of low storage and constrained Qatari supply, Dutch TTF approximately doubled between late February and mid-March 2026, rising from roughly e30/MWh to over e60/MWh, before easing to e48.76/MWh by 1 April as diplomatic signals emerged.

Figure 1 shows the indicative price trajectory during the disruption. The persistent premium of the JKM benchmark over TTF is central to the cargo diversion argument developed in Section 4.

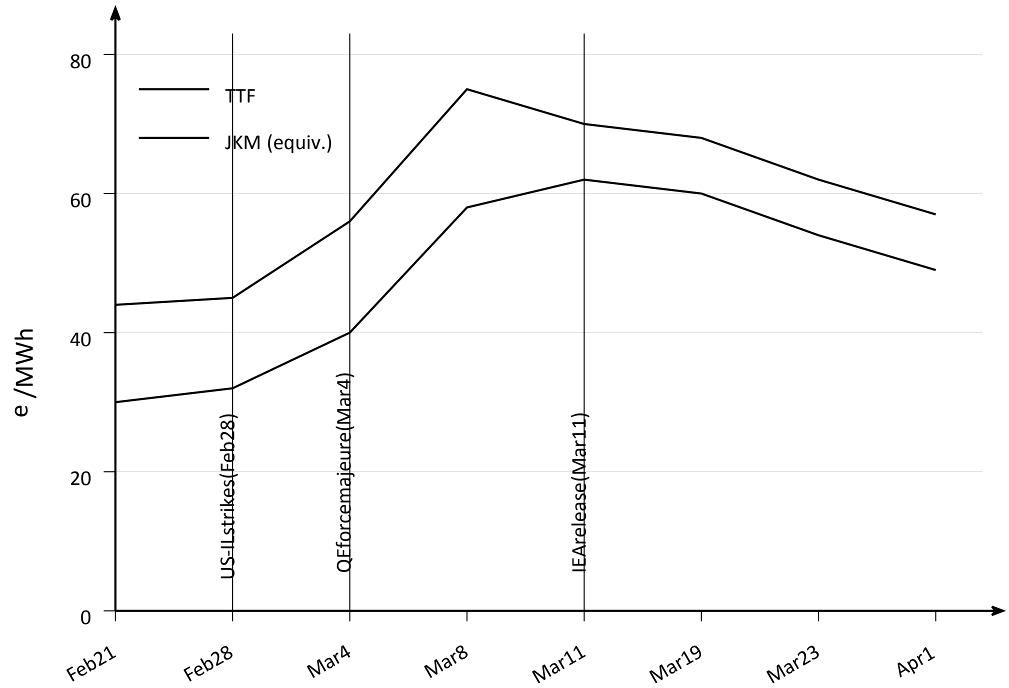

Figure 1: TTF and JKM (Japan-Korea Marker, converted to e/MWh at $1 = e0.92 and 1 MMBtu = 0.293 MWh) during the Hormuz disruption. Key events are marked. JKM's persistent premium over TTF is the basis for the cargo diversion argument in Section 4.

3. Deadweight Loss Under a Hypothetical Emergency Cap

3.1 Setup

For a price ceiling $P_{cap} < P_{eq}$, the lower-bound approximation to the welfare cost is:

$$DWL \approx \frac{1}{2}\,(P_{eq} - P_{cap})\,(Q_{eq} - Q_{cap}) \tag{1}$$

where Q_{cap} Q_s, the quantity supplied under the cap, and all quantities are in energy units (TWh). The formula gives the area of a right triangle in price-quantity space. It is a lower bound because consumers' marginal willingness to pay at Q_{cap} exceeds P_{eq}, so the exact Marshallian welfare loss, bounded above by the demand curve and below by the supply curve over the interval $[Q_{cap}, Q_{eq}]$, is larger. The approximation is adequate for order-of-magnitude calibration.

The supply response to a price reduction is modelled as:

$$Q_{cap} = Q_{eq} \cdot \frac{P_{cap\ \varepsilon_s}}{P_{eq}} \qquad (2)$$

where ε_s is the short-run supply elasticity. For calibration purposes this note uses ε_s [0.10, 0.20], a range consistent with import-constrained market conditions as discussed in ACER and IEA assessments.[9] Monthly EU natural gas consumption in the spring period is approximately 35 bcm, or 369 TWh.[10]

Figure 2 illustrates the welfare geometry.

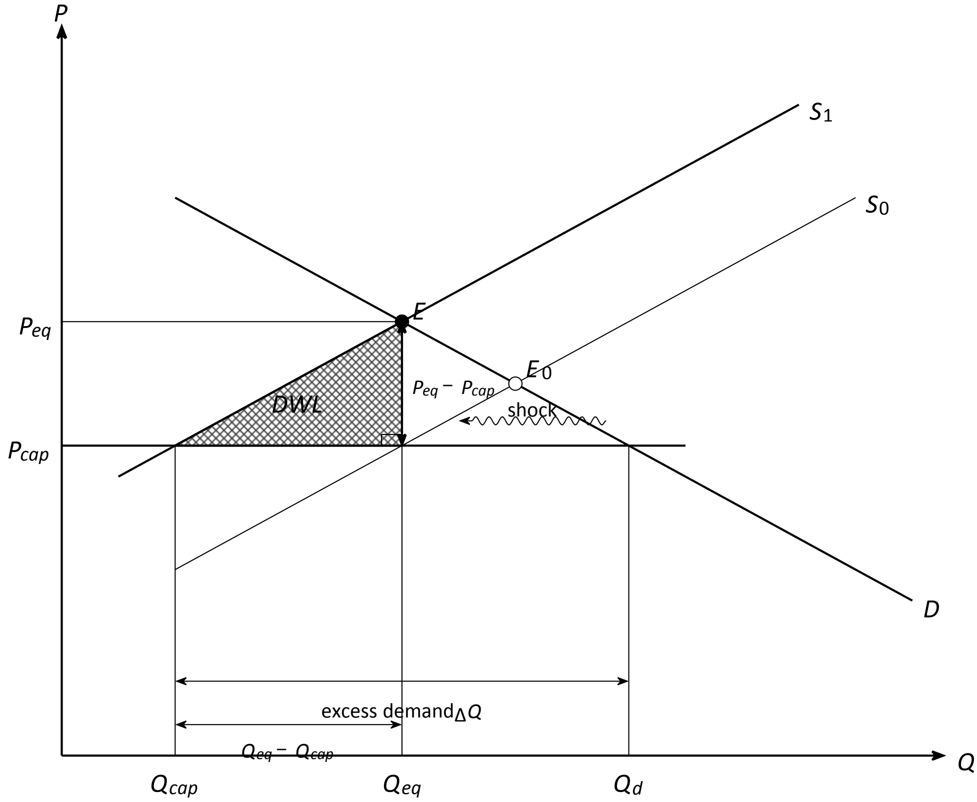

Figure 2: Lower-bound deadweight loss approximation under a price ceiling in a supply-shock environment (Equation 1). Supply shifts from S_0 to S_1. The cap at P_{cap} creates a supply shortfall $Q_{eq} - Q_{cap}$ and excess demand $\Delta Q = Q_d - Q_{cap}$. The cross-hatched right triangle has vertices at (Q_{cap}, P_{cap}), (Q_{eq}, P_{cap}), and $E = (Q_{eq}, P_{eq})$; its area equals $\frac{1}{2}(P_{eq} - P_{cap})(Q_{eq} - Q_{cap})$. The sloped side of the triangle connects (Q_{cap}, P_{cap}) to E; in this linearised schematic it approximates the relevant segment of S_1. E_0: pre-shock equilibrium on S_0 D. E : post-shock equilibrium on S_1 D. Because consumers' marginal willingness to

[9] ACER, *Gas Market Monitoring Report Q4 2025*; IEA, *European Gas Security Review 2025*. These figures reflect the elasticity of LNG spot supply to European terminals in a tight market; pipeline supply has limited short-run flexibility.

[10] Eurogas, *European Natural Gas Demand Statistics 2025*; seasonal adjustment by author.

pay at Q_{cap} exceeds P_{eq}, the exact welfare loss, bounded by D above and S_1 below over $[Q_{cap}, Q_{eq}]$, is larger than this triangle.

3.2 Parameter Justification and Sensitivity

A cap would be politically credible only when TTF has risen materially above current levels. Dutch TTF currently settles near e48.76/MWh; the sensitivity analysis therefore models a prolongeddisruption scenario in which TTF rises toward the e120–140/MWh range, consistent with a Hormuz closure extending through the 2026 summer refill season.[11] Cap levels of e80–100/MWh represent a plausible emergency intervention range: politically meaningful, yet below the expired MCM threshold of e180/MWh. The monthly demand normalisation of 369 TWh is held fixed across the table; incorporating endogenous demand response would alter levels but not the directional mechanism.

Table 1: DWL Lower-Bound Estimates in EUR Million per Month. Monthly demand fixed at 369 TWh (35bcm×10.55TWh/bcm). Bold: central scenario (see paragraph below). All estimates are lower bounds; OTC and WRI shadow pricing add further welfare costs not captured here.

		P_{cap} (EUR/MWh)		
P_{eq} (EUR/MWh)	ε_S	80	90	100
	0.10	290	160	65
120	0.15	435	235	100
	0.20	575	310	130
	0.10	435	265	145
130	0.15	645	395	215
	0.20	855	525	280
	0.10	600	400	245
140	0.15	890	590	365
	0.20	1,170	780	480

The bold cell (P_{eq} = e130, P_{cap} = e90, ε_s = 0.15) is selected as the central scenario for the following reasons. An equilibrium around e130/MWh reflects a level at which a cap would become politically salient, based on 2022 precedent: the MCM debate intensified once TTF crossed e100/MWh and emergency legislation was drafted by November 2022. A cap at e90/MWh represents a moderate intervention, below both the old MCM threshold and the more aggressive e80/MWh level debated but rejected in late 2022. The elasticity of 0.15 is a central calibration consistent with ACER's discussion of import-constrained supply conditions. The resulting estimate of approximately EUR 395 million per month is a lower bound on the monthly welfare cost. Across the central equilibrium row (P_{eq} = e130) and cap levels of e80–100/MWh, the range is EUR 215–645 million per month.

[11] These values are well below the 2022 crisis peak of e342/MWh. They are treated here as a moderate stress scenario for a prolonged disruption, not a tail event.

3.3 A Structural Caveat: Non-Linearity and the Cost of Non-Served Energy

The triangular approximation in Equation (1) and the power-function supply model in Equation (2) both assume a smoothly responsive supply curve. In a physical scarcity crisis, this assumption is likely to break down in a material way. European LNG supply is constrained not only by price incentives but by hard physical limits: nameplate regasification capacity (approximately 220 bcm/year across EU terminals as of 2025, much of it already utilised at high load), available tanker positions, and pipeline transit rights. Once these capacity ceilings are reached, the supply curve transitions from sloped to nearly vertical. Additional price increases attract no further volume; the marginal unit of gas is simply unavailable at any price.

This "hockey stick" shape has a direct implication for welfare measurement. When rationing is unavoidable, the relevant cost is no longer the area under a smoothly declining demand curve. It is the *Cost of Non-Served Energy* (CNSE), which for industrial firm-load shedding in Germany and other gas-intensive European economies is typically estimated in the range of e10,000–50,000/MWh, several orders of magnitude above the market price.[12] The EUR 395 million central estimate should therefore be read as applicable to the portion of the welfare loss that arises from smooth supply diversion. The portion arising from hard physical rationing, which is likely to dominate if the Hormuz disruption persists through the 2026 summer refill season, is almost certainly substantially larger and is not captured by the triangle framework.

4. Cargo Diversion and the Netback Mechanism

The welfare loss identified above operates through a specific market mechanism. A physical LNG trader choosing between a European and an Asian terminal compares:

$$NB_{EU} = P_{TTF} - c_{EUship} - c_{EUport} \qquad (3)$$

$$NB_{Asia} = P_{JKM} - c_{Asia_{ship}} - c_{Asia_{port}} \qquad (4)$$

A cap that suppresses P_{TTF} to P_{cap} mechanically reduces NB_{EU}. The following worked example uses stylised values anchored to approximate current freight, port, and insurance conditions; all figures are in EUR/MWh, with JKM and freight converted at \$1 = e0.92 and 1 MMBtu = 0.293 MWh.[13]

Without cap ($P_{TTF} = P_{eq}$ = e130/MWh):

$$NB_{EU} = 130 - 8\text{ (freight)} - 3\text{ (port/regas)} - 7\text{ (WRI)} = 112 \text{ e/MWh}$$

[12] These CNSE estimates are widely cited in European energy security literature, including IEA and ENTSO-G adequacy assessments, and reflect the combined cost of production stoppages, supply-chain disruption, and emergency fuel switching. They are not directly comparable to the DWL triangle, which measures allocative inefficiency under smooth supply response; they measure the welfare cost when supply response is physically exhausted.

[13] Cost components are stylised proxies for current market conditions. Atlantic Basin LNG shipping costs to NorthWest Europe are broadly \$0.5–2.0/MMBtu depending on vessel class and charter duration. The WRI premium of EUR 7/MWh represents the midpoint of the Lloyd's JWC Listed Areas Update range of \$1.5–3.0/MMBtu for March 2026. Port and regas costs are illustrative order-of-magnitude estimates; exact values vary by terminal.

$$NB_{Asia} = 110 - 5\text{ (freight)} - 2\text{ (port)} = 103\text{ e/MWh}$$

Margin in favour of Europe: +9 EUR/MWh. Spot cargo directed to Europe.

With cap (P_{cap} = e90/MWh; P_{JKM} unchanged):

$$NB_{EU} = 90 - 8 - 3 - 7 = 72\text{ e/MWh}$$

$$NB_{Asia} = 110 - 5 - 2 \qquad = 103\text{ e/MWh}$$

Margin in favour of Asia: −31 EUR/MWh. Cargo diverted away from Europe.

A EUR 40/MWh cap moves a +9 EUR/MWh pro-European margin to a −31 EUR/MWh antiEuropean margin. For uncommitted spot cargoes, traders can redirect a vessel in transit up to roughly two to three days before arrival; the market-level routing response would therefore likely be visible within a few weeks of the cap taking effect. On medium-term contracted volumes, adjustment would likely take considerably longer as procurement agreements are renegotiated.

The War Risk Insurance surcharge of EUR 7/MWh is not subject to any cap regulation, since it is invoiced as a separate insurance line item outside the reference price. Under a cap regime, WRI and related surcharges become the primary vector through which the true cost of supply reaches the seller's income statement while the official transaction price remains at the capped level. The cap does not reduce the economic cost of supply; it obscures it.

4.1 The Destination Clause Constraint

The netback comparison above describes the incentive structure for uncommitted spot cargoes, which constitute roughly 15–20 per cent of global LNG trade in a normal market year.[14] The remaining 80–85 per cent is governed by long-term Sale and Purchase Agreements (SPAs) that typically contain destination clauses, legally specifying the port or region of delivery. A cargo contracted under such an agreement cannot be simply rerouted to Asia because the TTF price has been capped; doing so would constitute a breach of contract.

The practical implication is that the netback diversion mechanism operates primarily on the spot margin. A price cap reduces Europe's competitiveness for the 15–20 per cent of supply that is genuinely allocable, while leaving the majority of contractual flows nominally in place. This appears to soften the cargo diversion effect, but it introduces a different and potentially more severe problem: rather than rerouting, sellers subject to a below-cost capped price may invoke price review clauses embedded in their SPAs, triggering contract renegotiation or, in extremis, force majeure claims that suspend delivery obligations entirely. The QatarEnergy

[14] IGU, *World LNG Report 2025*. The spot and short-term share of global LNG trade has grown significantly since 2010 but still represents a minority of total volume; long-term contracted volumes dominate the physical market, particularly for Qatari and US feedgas.

force majeure declared on 4 March 2026 following the Ras Laffan strikes is an example of a supply obligation being suspended under physical impossibility; a cap-driven economic impossibility claim would be less straightforward legally but is not without precedent.

The distinction between spot and contracted volumes also matters for the policy comparison in Section 7. Targeted consumer transfers leave long-term SPA volumes in place and unaffected. A broad wholesale cap, by contrast, may trigger contract-level responses in the very volumes that were assumed to be stable, producing a supply risk that is larger and less visible than the spot diversion modelled above.

5. What a Cap Binds and What It Does Not

A cap on the exchange reference price does not bind all layers of the price chain with equal force. Starting from the wholesale reference and moving toward the end user: (i) the exchange reference price (TTF) is directly capped; (ii) physical import contract prices, typically indexed to TTF but sometimes priced bilaterally, are partially affected though OTC bilaterals were outside MCM scope and would likely remain so; (iii) effective delivered cost, which includes freight, regas, port fees, WRI surcharges, and cargo specification adjustments, is partially insulated from the cap because these components are invoiced separately; (iv) retail and industrial pass-through depends on national regulation and hedge positions; and (v) end-user affordability depends on pass-through rates, transfer programmes, and income.

In the current disruption, the primary driver of high delivered costs is not speculative excess on exchange-traded futures but physical supply unavailability and elevated War Risk Insurance. A cap on the exchange reference price is therefore likely to address the least binding constraint in the chain.

6. The Power Market Linkage: Spark Spreads and Cap Leakage

A gas price cap does not act in isolation. In European power markets, gas-fired generation is typically the marginal technology, setting the electricity clearing price for a substantial share of hours. The clean spark spread, defined as:

$$CSS = P_{power} - \left(\frac{P_{gas}}{HR}\right) - (EF \times P_{carbon}) \tag{5}$$

where HR is the heat rate (MWh of gas per MWh of electricity, typically 1.7–2.0 for modern combined-cycle plant), EF is the emission factor, and P_{carbon} is the ETS carbon price, captures the profitability of gas-to-power conversion.

A cap that suppresses P_{gas} to $P_{cap} < P_{eq}$ while leaving P_{power} and P_{carbon} to clear at market rates widens the clean spark spread for all gas-fired generators. This creates a windfall margin for operators who can access capped gas and sell power at an uncapped price. Three transmission effects follow.

First, gas-fired generators may increase their bid quantities, consuming gas faster than under market pricing and accelerating the drawdown of storage or import capacity that Europe can least afford to exhaust. *Second*, if power prices remain elevated because physical electricity scarcity is real, the crush spread for utilities that can buy capped gas and sell at spot power prices represents a transfer from the policy instrument to generator balance sheets, rather than to end consumers. *Third*, if EU power prices diverge downward from interconnected non-EU markets, the uncapped spread may incentivise electricity exports, effectively subsidising foreign consumers rather than domestic households.

The magnitude of this effect depends on the share of gas in the marginal generation mix, the degree of power market coupling, and the extent of cap enforcement across the gas-to-power chain. In a period of physical gas scarcity, widening spark spreads through a gas cap risks accelerating fuel drawdown in the sector least able to switch away from gas in the short term. A cap designed to protect households may therefore leak its welfare benefit into generator margins before it reaches end-user bills, unless the retail pass-through mechanism is simultaneously regulated, which introduces further distortions at layer (iv) of the transmission chain described in Section 5.

7. Policy Alternatives

The appropriate benchmark is not a broad cap versus no intervention. A credible alternative combines wholesale price signal preservation with targeted consumer protection, through direct consumer transfers indexed to household income, pre-contracted industrial interruptibility arrangements, and coordinated reserve deployment via the existing IEA mechanism.

A broad wholesale cap is likely to underperform this alternative on most criteria under current market conditions. Suppressing the exchange reference price reduces the probability that European netback exceeds Asian netback, and swing cargoes are more likely to be diverted away from European terminals at precisely the moment Europe needs alternative supply. A depressed forward curve is also less likely to support the commercial case for accelerating LNG import infrastructure. OTC bilateral contracts, WRI surcharges, and cargo specification premiums provide routes around a reference-price cap, creating shadow pricing without eliminating the underlying scarcity. And a broad cap appears less well-targeted than direct transfers, since it subsidises all buyers including large industrial consumers with bilateral hedging capacity, rather than the households and SMEs most exposed to price volatility.

The targeted alternative appears better positioned on most of these criteria. Direct transfers do not affect import netbacks. Interruptibility contracts, negotiated ex ante with compensation embedded in tariff structures, are market instruments: negotiated freely, priced into the tariff before the disruption, and activated under conditions the buyer has pre-agreed. This is structurally different from cap-induced physical rationing, in which an uncompensated supply shortfall is allocated by administrative fiat among buyers who had no prior notice of the curtailment risk. Reserve release reduces physical scarcity directly, though the current 400 mb release covers only 3.8 days of global demand and is insufficient as a standalone response.

One genuine uncertainty should be stated. If the disruption proves short-lived, which diplomatic signals in late March 2026 suggest is at least possible, the case against a temporary cap becomes less stark. Spot cargo diversions would likely take at least a few weeks to become visible in delivery patterns; a cap in place for only a short period may not be in force long enough to trigger large-scale diversion. The analysis above applies most forcefully to a disruption running through the 2026 summer refill season.

8. Conclusion

A new emergency wholesale cap enacted under current market conditions would, on the basis of the calibration in Table 1, likely generate lower-bound welfare costs in the range of EUR 215–645 million per month under the central parameter assumptions. These estimates are lower bounds in two senses: they exclude OTC shadow pricing and WRI surcharges, and they assume a smoothly responsive supply curve. When European regasification capacity is physically constrained, the relevant welfare measure shifts toward the Cost of Non-Served Energy, which is several orders of magnitude larger per unit of undelivered gas.

A primary transmission mechanism is the suppression of the import netback signal. A cap from e130 to e90/MWh reverses a +9 EUR/MWh pro-European cargo routing margin into a −31 EUR/MWh anti-European margin in the worked example. This mechanism operates primarily on the spot fraction of LNG trade (roughly 15–20 per cent). The larger contracted fraction is not immediately affected by netback diversion but may instead trigger price review clauses or force majeure claims, introducing a different and less visible supply risk.

A gas price cap also leaks into the power market. Suppressing the gas price while electricity and carbon prices remain market-determined widens clean spark spreads, creating generator windfalls and potentially accelerating gas drawdown in the sector least able to switch fuel at short notice.

The targeted alternative, combining direct consumer transfers with pre-contracted interruptibility and IEA reserve coordination, appears better positioned than a broad cap on most criteria that matter for medium-term supply security. The weight of the evidence favours this approach under a prolonged disruption scenario; under a rapid resolution, the comparison becomes less stark.

The most precise statement of the finding is this: under conditions of physical scarcity, a broad wholesale cap that severs import netbacks is more likely to reduce delivered volumes than to reduce delivered costs. In the current Hormuz scenario, this mechanism is likely to be one of the main effects of any such instrument.

A. Data Appendix

All quantitative claims in this note are traceable to the entries in Table 2.

Table 2: Reproducibility Register

Claim	Value, unit	Derivation	Primary source
Strait flows pre-war	20 mb/d	reported	IEA Strait Factsheet, Feb. 2026
Current flows vs pre-war	<10%	reported	IEA OMR March 2026
Gulf production loss	≥10 mb/d	reported	IEA OMR March 2026
Brent peak (8 March) 2026	$126/bbl	reported	IEA OMR March 2026
IEA reserve release	400 mb	reported	IEA Press Release, 11 March 2026
Global liquids demand	105.17 mb/d	reported	EIA STEO March 2026
Reserve coverage	3.81 days	400÷105.17	author's calculation
Qatar FM capacity loss	≈17%	documented partial	QatarEnergy; Reuters/Bloomberg, 19-22 March 2026
EU storage fill	≈30%	reported	ACER monitor; Euronews, 31 March 2026
TTF pre-crisis	e30/MWh	approximate	IEA OMR; ACER
EU monthly demand	369 TWh	35×10.55	Eurogas 2025
Supply elasticity range	0.10-0.20	literature	ACER GMR Q4 2025; IEA Gas Security 2025
WRI surcharge (March)	$1.5-3.0/MMBtu	market reports	JWC Listed Areas Update, March 2026

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